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DIVISION OF
OIL, GAS & MINING

March 1, 1990

Mr. Ken A. Kluksdahl
Tenneco Minerals
P.O. Box 2650
955 North 1300 West #4
St. George, Utah 84770

Subject: Goldstrike Heap Leach Facility, Pad No. 2
Construction Permit

Dear Mr. Kluksdahl:

We have completed our review of the plans and specifications, for the construction of heap leach pad No. 2, submitted on November 13, 1989. Revised plans and additional information, prepared by your staff and Mr. George Toland, was received on February 8, 1990.

The project complies with the current design requirements and practices for heap leach facilities. A **construction permit** is hereby issued as constituted by this letter, subject to the following conditions:

1. The use of *sulfide ore* for fill below the base course is approved provided that:
 - a. The ore is adequately mixed with limestone in accordance with the requirements of the Division of Oil Gas and Mining.
 - b. The fill area in the base course must be constructed to avoid excessive settlement. The last 10 feet of end dump material must be compacted to a minimum dry density of 95 percent of the maximum dry density obtained by Standard Proctor Method. This will be completed prior to construction of the base course.
 - c. Up and down gradient ground water monitoring wells must be drilled and sampled on or before July 1, 1990.

2. The following inspections must be scheduled two (2) days *before* completion of the listed work item or component and before construction of the next sequenced work item or component:
 - a. Construction of leak detection system base,
 - b. Construction of the leak detection media,
 - c. Construction of each lift of the secondary clay liner,
 - d. Installation and field seaming of the flexible membrane liner before the surface is covered with any material.
3. Leaching operations must not start before a written authorization is issued for the facilities, following the final inspection by the Bureau of Water Pollution Control (the Bureau).
4. Any liquid detected in any leak detection sump shall be reported to the Bureau by phone within 24 hours and in writing within 5 days. The contents of the liquid shall be analyzed immediately, using approved analytical procedures, for pH, cyanide [CN⁻], copper [Cu²⁺], gold [Au³⁺] and cobalt [Co²⁺].
5. Piezometers or other acceptable devices to monitor the head on the primary (geomembrane) liner must be installed. These devices must be monitored on a daily basis for first thirty (30) days of use, and weekly thereafter. Plans for these devices must be submitted for review and approval prior to construction. Measured heads exceeding twelve (12) inches must be reported to the Bureau in writing within five (5) days. Monitoring and reporting frequencies may be amended by the executive secretary.
6. This construction permit allows the use of the heap leach pad described herein until **April 1, 1995**.
7. The Bureau shall be notified in writing upon cessation of leaching operations. Closure and neutralization procedures shall begin on or before **April 1, 1995**.
8. The neutralization criteria shall be as adopted or as approved in writing by the Utah Water Pollution Control Committee at the time of decommissioning.

9. The attainment of agreed upon neutralization criteria must be verified in three (3) tests reasonably spaced during a twenty-four (24) hour period.
10. All changes to these approved plans and specifications must be reviewed and approved by the Bureau.
11. The project shall be inspected continuously while under construction by a qualified and independent construction inspector. The certification of the construction of the facilities in accordance with the approved plans, specifications, addenda, change orders and quality assurance procedures must be submitted to the Bureau at the time of final inspection. Periodic summaries of the inspection reports must be available to the Bureau during interim inspections.
12. An amended version of the operations and maintenance manual and the contingency plan reflecting the facilities approved herein and associated operation, must be submitted to the Bureau for review and approval *on or before April 15, 1990.*

The approved project is described as follows:

1. The approved heap leach pad covers a total area of 16 acres, and ore will be stacked upon this pad to a maximum height of 150 feet.
2. Process solution collection system will limit process fluid head to 12 inches.
3. The heap leach pad liner system capable of retaining its integrity under the ore loads imposed from the top down:
 - a. 60-mil minimum high density polyethylene (HDPE) primary liner
 - b. Twelve (12) inch minimum secondary clay liner having maximum hydraulic conductivity of 2.0×10^{-7} centimeters per second
 - c. Six (6) inch minimum leak detection media having minimum hydraulic conductivity of 1.0×10^{-2} centimeters per second
 - d. Six (6) inch minimum of base course having maximum hydraulic conductivity of 1.0×10^{-6} centimeter per second
4. Settlement stands will be installed at 20 locations to measure differential settlement between undisturbed ground and cut and fill areas under the

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pad. Measurements must be made monthly. The results must be reported to the Bureau in writing on a quarterly basis.

5. All liner anchor trenches will be 12 inches or more deep and must be filled with acceptable material properly packed or compacted.
6. Approximately 6 acres of heap leach pad surface area will be leached at any one time.
7. The process solution collection system (over liner) will consist of 18 inches of one (1) inch minus material; topped by 18 inches of four (4) inch minus ore.
8. The leak detection system will be divided by clay barriers and each section shall have individual leak detection pipes.
9. The leak detection layer will be graded such that no piping of fine material from the clay liner occurs.
10. The maximum slope for stacking ore is 2 horizontal to 1 vertical
11. The quality assurance tests and frequency of testing for the leak detection system base will be the same as for the secondary clay liner.
12. The heap leach pad will be surrounded by perimeter berms and drainage ditches to direct surface runoff around the project and into down gradient drainages.

A set of approved plans and specifications is returned herewith bearing our construction permit stamp. This set of plans must be kept available for examination and inspection to be conducted by the Bureau of Water Pollution Control, and for resolution of any conflicts or discrepancies in installation that may arise.

A notice of intent to issue a ground water discharge permit under the *Ground Water Quality Protection Rules (R448-6, Utah Administrative Code)* has been published. The issuance of this permit does not relieve you in any way of obtaining applicable permits from local jurisdictions. You may contact Mr. William K. Dawson, of the Southwest District Health Department, at (801) 586-2437 for compliance with any other local requirements.

Please be advised that release of certain pollutants from this facility may cause the facility to be placed on the national priority list of hazardous substance sites by the US Environmental Protection Agency, pursuant to the provisions of the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)*. All wastes not exempt under the mining

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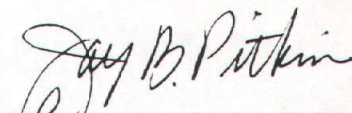
exemption will need to be managed in accordance with Utah's Hazardous Waste Management regulations (i.e. spent solvents, off specification chemicals, undesirable metals in the leach solutions etc.).

Please advise us of the beginning of construction. This will enable us to monitor the progress and schedule periodic inspections. Mr. Wayne Thomas, P. E., Southwest District Engineer, will also assist us in inspections. Mr. Thomas can be reached at (801) 673-3528 for necessary scheduling. The staff of the Division of Oil, Gas and Mining, is requested, by copy of this letter, to check all leak detection sumps at the facility during their inspections.

Please call Mr. Lyle Stott of my staff if there are any questions.

Sincerely,

Utah Water Pollution Control Committee


for Don A. Ostler, P.E.
Executive Secretary

LWS:rvg

Enclosure: As noted

cc: Mr. Wayne Thomas, P. E., Southwest District Health Department
Mr. William K. Dawson, Southwest District Health Department
Mr. Lowell Braxton, Division of Oil, Gas and Mining

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